

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Sherry Leonard *et al.*

Serial No.: 08/956,518

Filed: 10/23/97

Entitled: ALPHA-7 NICOTINIC RECEPTOR

Group No.: 1645

Examiner: R. Hayes

**INFORMATION DISCLOSURE
STATEMENT TRANSMITTAL**

Assistant Commissioner for Patents
Washington, D.C. 20231

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Dated: March 30, 1999

By: Marlene Garitano

Marlene Garitano

Sir:

Enclosed please find an Information Disclosure Statement and Form PTO-1449, including copies of the references contained thereon, for filing in the U.S. Patent and Trademark Office.

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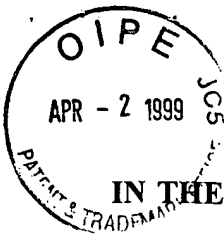
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PATENT
Attorney Docket No. UTC-3042

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By: 

Marlene Garitano

Sir:

The citations listed below, copies attached, may be material to the examination of the above-identified application, and are therefore submitted in compliance with the duty of disclosure defined in 37 C.F.R. §§ 1.56 and 1.97. The Examiner is requested to make these citations of official record in this application.

The following printed publications are referred to in the body of the specification:

- U.S. Patent No. 5,589,466 to Felgner *et al.*;
- U.S. Patent No. 5,580,859 to Felgner *et al.*;
- U.S. Patent No. 5,459,127 to Felgner *et al.*;
- U.S. Patent No. 5,399,346 to Anderson *et al.*;
- U.S. Patent No. 5,322,770 to Gelfand;
- U.S. Patent No. 5,124,263 to Temin *et al.*;
- U.S. Patent No. 4,980,289 to Temin *et al.*;
- U.S. Patent No. 4,965,188 to Mullis;
- U.S. Patent No. 4,946,778 to Ladner *et al.*;
- U.S. Patent No. 4,861,719 to Miller;
- U.S. Patent No. 4,683,202 to Mullis;

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- U.S. Patent No. 4,683,195 to Mullis;
- U.S. Patent No. 4,650,764 to Temin *et al.*;
- Adler *et al.*, "Normalization by Nicotine of Deficient Auditory Sensory Gating in the Relatives of Schizophrenics," *Biol. Psych.* 32: 607-616 (1992);
- Adler *et al.*, "Normalization of Auditory Physiology by Cigarette Smoking in Schizophrenic Patients," *Am. J. Psychol.* 150: 1856-1861 (1993);
- Adler *et al.*, "Neurophysiological Studies of Sensory Gating in Rats: Effects of Amphetamine, Phencyclidine, and Haloperidol," *Biol. Psychiat.* 21: 787-798 (1986);
- Adler *et al.*, "Neurophysiological Evidence for a Defect in Neuronal Mechanisms Involved in Sensory Gating in Schizophrenia," *Biol. Psychiat.* 17: 639-654 (1982);
- Albertsen *et al.*, "Construction and characterization of a yeast artificial chromosome library containing seven haploid human genome equivalents," *Proc. Natl. Acad. Sci.* 87: 4256-4260 (1990);
- Alkondon and Albuquerque, "Diversity of Nicotinic Acetylcholine Receptors in Rat Hippocampal Neurons. I. Pharmacological and Functional Evidence for Distinct Structural Subtypes," *J. Pharm. Ex. Ther.* 265: 1455-1473 (1993);
- Amar *et al.*, "Agonist pharmacology of the neuronal $\alpha 7$ nicotinic receptor expressed in *Xenopus* oocytes," *FEBS* 327: 284-288 (1993);
- Anderson and Young, "Quantitative Filter Hybridization," in *Nucleic Acid Hybridization A Practical Approach*, Hames and Higgins (eds.), pp. 73-109, IRL Press (1985);
- Barnes, "PCR Amplification of up to 35-kb DNA with high fidelity and high yield from λ bacteriophage templates," *Proc. Natl. Acad. Sci. U.S.A.* 91: 2216-2220 (1994);
- Beard *et al.*, "Transcription Mapping of Mouse Adenovirus Type 1 Early Region 3," *Virology*, pp. 75-81 (1990);
- Beeson *et al.*, "The human muscle nicotinic acetylcholine receptor α -subunit exists as two isoforms: a novel exon," *EMBO J.* 9: 2101-2106 (1990);

- Bender *et al.*, "Evidence that the Packaging Signal of Moloney Murine Leukemia Virus Extends into the *gag* Region," *J. Virol.* 61: 1639-1646 (1987);
- Bernstein *et al.*, "Gene Transfer with Retrovirus Vectors," *Genet. Eng.* 7: 235-261 (1985);
- Bessis *et al.*, "Negative regulatory elements upstream of a novel exon of the neuronal nicotinic acetylcholine receptor of $\alpha 2$ subunit gene," *Nucl. Acids Res.* 21: 2185-2192 (1993);
- Bickford-Wimer *et al.*, "Auditory Sensory Gating in Hippocampal Neurons: A Model System in the Rat," *Biol. Psychiat.* 27: 183-192 (1990);
- Bickford and Wear, "Restoration of sensory gating of auditory evoked response by nicotine in fimbria-fornix lesioned rats," *Brain Res.* 705: 235-240 (1995);
- Biedler *et al.*, "Multiple Neurotransmitter Synthesis by Human Neuroblastoma Cell Lines and Clones," *Cancer Res.* 38: 3751-3757 (1978);
- Blount and Merlie, "Mutational Analysis of Muscle Nicotinic Acetylcholine Receptor Subunit Assembly," *J. Cell Biol.* 111: 2613-2622 (1990);
- Boshart *et al.*, "A Very Strong Enhancer is Located Upstream of an Immediate Early Gene of Human Cytomegalovirus," *Cell* 41:521-530 (1985);
- Boutros and Overall, "Replication and Extension of P50 Findings in Schizophrenia," *Clin. Electroencephalog.* 22: 40-45 (1991);
- Braff *et al.*, "Gating and Habituation of the Startle Reflex in Schizophrenic Patients," *Arch. Gen. Psychiat.* 49: 206-215 (1992);
- Breier *et al.*, "National Institute of Mental Health Longitudinal Study of Chronic Schizophrenia, Prognosis and Predictors of Outcome," *Arch. Gen. Psychiat.*, 48: 239-246 (1991);
- Brownstein *et al.*, "Isolation of Single-Copy Human Genes from a Library of Yeast Artificial Chromosome Clones," *Science* 244: 1348-1351 (1989);
- Burke *et al.*, "Cloning of Large Segments of Exogenous DNA into Yeast by Means of Artificial Chromosome Vectors," *Science* 236: 806-812 (1987);
- Calzolari *et al.*, "Psychiatric Disorder in a Familial 15;18 Translocation and Sublocalization of Myelin Basic Protein to 18q22.3," *Am. J. Med. Genet.* 67: 154-161 (1996);

- Cameron *et al.*, "Dendritic Cells Exposed to Human Immunodeficiency Virus Type-1 Transmit a Vigorous Cytopathic Infection to CD4⁺ T Cells," *Science* 257: 383-387 (1992);
- Casaubon *et al.*, "The Gene Responsible for a Severe Form of Peripheral Neuropathy and Agenesis of the Corpus Callosum Maps to Chromosome 15q," *Am. J. Hum. Genet.* 58: 28-34 (1996);
- Chamberlin *et al.*, "New RNA Polymerase from *Escherichia coli* infected with Bacteriophage T7," *Nature* 228:227-231 (1970);
- Chomczynski and Sacchi, "Single-Step Method of RNA Isolation by Acid Guanidinium Thiocyanate-Phenol-Chloroform Extraction," *Anal. Biochem.* 162: 156-159 (1987);
- Chumakov *et al.*, "Continuum of overlapping clones spanning the entire human chromosome 21q," *Nature* 359: 380-386 (1992);
- Clarke, "Prader-Willi Syndrome and Psychoses," *Brit. J. Psychiat.* 163: 680-684 (1993);
- Cole *et al.*, "The EBV-Hybridoma Technique and its Application to Human Lung Cancer," in *Monoclonal Antibodies and Cancer Therapy*, Reisfeld *et al.* (eds.), pp. 77-96, Alan R. Liss, Inc. (1985);
- Conti-Tronconi *et al.*, "Brain and muscle nicotinic acetylcholine receptors are different but homologous proteins," *Proc. Natl. Acad. Sci. U.S.A.* 82: 5208-5212 (1985);
- Coon *et al.*, "Search for Mutations in the $\beta 1$ GABA_A Receptor Subunit Gene in Patients with Schizophrenia," *Am. J. Med. Genet.* 54: 12-20 (1994);
- Coon *et al.*, "Use of a Neurophysiological Trait in Linkage Analysis of Schizophrenia," *Biol. Psychiat.* 34: 277-289 (1993);
- Cooper *et al.*, "Pentameric structure and subunit stoichiometry of a neuronal nicotinic acetylcholine receptor," *Nature* 350: 235-238 (1991);
- Cote *et al.*, "Generation of human monoclonal antibodies reactive with cellular antigens," *Proc. Natl. Acad. Sci. U.S.A.* 80: 2026-2030 (1983);

- Couturier *et al.*, "A Neuronal Nicotinic Acetylcholine Receptor Subunit ($\alpha 7$) Is Developmentally Regulated and Forms a Homo-Oligomeric Channel Blocked by α -BTX," *Neuron* 5: 847-856 (1990);
- Cullum *et al.*, "Neurophysiological and neuropsychological evidence for attentional dysfunction in schizophrenia," *Schizophrenia Res.* 10: 131-141 (1993);
- Curiel *et al.*, "High-Efficiency Gene Transfer Mediated by Adenovirus Coupled to DNA-Polylysine Complexes," *Hum. Gene Ther.* 3: 147-154 (1992);
- De Amicis *et al.*, "Reaction Time Crossover as a Marker of Schizophrenia and of Higher Functioning," *J. Nerv. Ment. Dis.* 174: 177-179 (1986);
- deLeon *et al.*, "Schizophrenia and Smoking: An Epidemiological Survey in a State Hospital," *Am. J. Psychiat.* 152: 453-455 (1995);
- Den-Dunnen *et al.*, "Topography of the Duchenne Muscular Dystrophy (DMD) Gene: FIGE and cDNA Analysis of 194 Cases Reveals 115 Deletions and 13 Duplications," *Am. J. Hum. Genet.* 45: 835-847 (1989);
- Deneris *et al.*, "Genes Encoding Neuronal Nicotinic Acetylcholine Receptors," *Clin. Chem.* 35: 731-737 (1989);
- Dijkema *et al.*, "Cloning and expression of the chromosomal immune interferon gene of the rat," *EMBO J.* 4:761-767 [1985];
- Dominguez del Toro *et al.*, "Immunocytochemical Localization of the $\alpha 7$ Subunit of the Nicotinic Acetylcholine Receptor in the Rat Central Nervous System," *J. Comp. Neurol.* 349: 325-342 (1994);
- Dracopoli *et al.*, *Current Protocols in Human Genetics*, John Wiley & Sons, Inc., New York, New York (1994) **(Will provide Title and Copyright pages at a later date should the Examiner desire a copy);**
- Eaton, "Epidemiology of Schizophrenia," *Epidemiol. Rev.* 7: 105-126 (1985);
- Elgoyhen *et al.*, " $\alpha 9$: An Acetylcholine Receptor with Novel Pharmacological Properties Expressed in Rat Cochlear Hair Cells," *Cell* 79: 705-715 (1994);
- EP 453243;
- EP 178220;
- Erlich (ed.), *PCR Technology*, Stockton Press (1989);

- Endicott and Spitzer, "A Diagnostic Interview, The Schedule for Affective Disorders and Schizophrenia," *Arch. Gen. Psychiat.* 35: 837-844 (1978);
- Erwin *et al.*, "Midlatency Auditory Evoked Responses in Schizophrenia," *Biol. Psychiat.* 30: 430-442 (1991);
- Felgner and Ringold, "Cationic liposome-mediated transfection," *Nature* 337: 387-388 (1989);
- Felgner *et al.*, "Lipofection: A highly efficient, lipid-mediated DNA-transfection procedure," *Proc. Natl. Acad. Sci. U.S.A.* 84: 7413-7417 (1987);
- Freedman *et al.*, " α -Bungarotoxin Binding to Hippocampal Interneurons: Immunocytochemical Characterization and Effects on Growth Factor Expression," *J. Neurosci.* 13: 1965-1975 (1993);
- Freedman *et al.*, "Elementary neuronal dysfunctions in schizophrenia," *Schiz. Res.* 4: 233-243 (1991);
- Freedman *et al.*, "Schizophrenia and Nicotinic Receptors," *Harvard Rev. Psychiat.* 2: 179-192 (1994);
- Freedman *et al.*, "Evidence in Postmortem Brain Tissue for Decreased Numbers in Hippocampal Nicotinic Receptors in Schizophrenia," *Biol. Psychiat.* 38: 22-33 (1995);
- Frohman, *Amplifications* 5: 11 (1990) **(Reference could not obtained at this time. Will provide reference at a later date should the Examiner desire a copy);**
- Galzi *et al.*, "Functional Architecture of the Nicotinic Acetylcholine Receptor: From Electric Organ to Brain," *Ann. Rev. Pharmacol.* 31: 37-72 (1991);
- Goff *et al.*, "Cigarette Smoking in Schizophrenia: Relationship to Psychopathology and Medication Side Effects," *Am. J. Psychiat.* 149: 1189-1194 (1992);
- Goff *et al.*, "Neural Origins of Long Latency Evoked Potentials Recorded from the Depth and from the Cortical Surface of the Brain in Man," *Prog. Clin. Neurophysiol.* 7: 126-145 (1980);

- Goldman *et al.*, "Members of a Nicotinic Acetylcholine Receptor Gene Family Are Expressed in Different Regions of the Mammalian Central Nervous System," *Cell* 48: 965-973 (1987);
- Gorman *et al.*, "The Rous sarcoma virus long terminal repeat is a strong promoter when introduced into a variety of eukaryotic cells by DNA-mediated transfection," *Proc. Natl. Acad. Sci. USA* 79: 6777-6781 [1982];
- Graham and van der Eb, "A New Technique for the Assay of Infectivity of Human Adenovirus 5 DNA," *Virology* 52: 456-467 [1973];
- Green, "Biochemical Mechanisms of Constitutive and Regulated Pre-mRNA Splicing," *Ann. Rev. Cell. Biol.* 7: 559-599 (1991);
- Griffith *et al.*, "Effects of sound intensity on a midlatency evoked response to repeated auditory stimuli in schizophrenic and normal subjects," *Psychophysiology* 32: 460-466 (1995);
- Hamera *et al.*, "Alcohol, Cannabis, Nicotine, and Caffeine Use and Symptom Distress in Schizophrenia," *J. Nerv. Mental Dis.* 183: 559-565 (1995);
- Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York;
- Hershman *et al.*, "GABA_B antagonists diminish the inhibitory gating of auditory response in the rat hippocampus," *Neurosci. Lett.* 190: 133-136 (1995);
- Holzman *et al.*, "A Single Dominant Gene Can Account for Eye Tracking Dysfunctions and Schizophrenia in Offspring of Discordant Twins," *Arch. Gen. Psychiat.* 45: 641-647 (1988);
- Hu and Worton, "Partial Gene Duplication as a Cause of Human Disease," *Hum. Mutat.* 1: 3-12 (1992);
- Huse *et al.*, "Generation of a Large Combinatorial Library of the Immunoglobulin Repertoire in Phage Lambda," *Science* 246: 1275-1281 (1989);
- Hyman, "Schizophrenia," in *Scientific American Medicine*, 13 VII: 1-5, Dale and Federman (eds.), New York, New York (1994);
- Judd *et al.*, "Sensory Gating Deficits in Schizophrenia: New Results," *Am. J. Psychiat.* 149: 488-493 (1992);

- Kacian *et al.*, "A Replicating RNA Molecule Suitable for a Detailed Analysis of Extracellular Evolution and Replication," *Proc. Natl. Acad. Sci. USA* 69: 3038-3042 [1972];
- Kaplitt *et al.*, "Expression of a Functional Foreign Gene in Adult Mammalian Brain following *in Vivo* Transfer via a Herpes Simplex Virus Type 1 Defective Viral Vector," *Mol. Cell. Neurosci.* 2: 320-330 (1991);
- Kim *et al.*, "Use of the human elongation factor 1 α promoter as a versatile and efficient expression system," *Gene* 91:217-223 [1990];
- Kohler and Milstein, "Continuous cultures of fused cells secreting antibody of predefined specificity," *Nature* 256: 495-497 [1975];
- Kozbor *et al.*, "The production of monoclonal antibodies from human lymphocytes," *Immun. Today* 4: 72-79 (1983);
- Kruglyak *et al.*, "Parametric and Nonparametric Linkage Analysis: A Unified Multipoint Approach," *Am. J. Hum. Genet.* 58: 1347-1363 (1996);
- Kuo *et al.*, "Efficient Gene Transfer Into Primary Murine Lymphocytes Obviating the Need for Drug Selection," *Blood* 82: 845-852 (1993);
- Lamond, "The Spliceosome," *BioEssays* 15: 595-603 (1993);
- La Salle *et al.*, "An Adenovirus Vector for Gene Transfer into Neurons and Glia in the Brain," *Science* 259: 988-990 (1993);
- Lathrop *et al.*, "Strategies for multilocus linkage analysis in humans," *Proc. Natl. Acad. Sci. U.S.A.* 81: 3443-3446 (1984);
- Lebkowski *et al.*, "Adeno-Associated Virus: a Vector System for Efficient Introduction and Integration of DNA into a Variety of Mammalian Cell Types," *Mol. Cell. Biol.* 8: 3988-3996 (1988);
- Lehrman *et al.*, "Duplication of Seven Exons in LDL Receptor Gene Caused by Alu-Alu Recombination in a Subject with Familial Hypercholesterolemia," *Cell* 48: 827-835 (1987);
- Lindstrom *et al.*, "Neuronal Nicotinic Receptor Subtypes," *Ann. NY Acad. Sci.* 757: 100-116 (1996);
- Lukas and Bencherif, "Heterogeneity and Regulation of Nicotinic Acetylcholine Receptors," *Int. Rev. Neurobiol.* 34: 25-131 (1992);

- Luntz-Leybman *et al.*, "Cholinergic gating of response to auditory stimuli in rat hippocampus," *Brain. Res.* 587: 130-136 (1992);
- Machy *et al.*, "Gene transfer from targeted liposomes to specific lymphoid cells by electroporation," *Proc. Natl. Acad. Sci. U.S.A.* 85: 8027-8031 (1988);
- Mäkelä *et al.*, "Whole-head mapping of middle-latency auditory evoked magnetic fields," *Electroencephalogr. Clin. Neurophysiol.* 92: 414-421 (1994);
- Maniatis *et al.*, "Regulation of Inducible and Tissue-Specific Gene Expression," *Science* 236: 1237-1244 (1987);
- Mann *et al.*, "Construction of a Retrovirus Packaging Mutant and Its Use to Produce Helper-Free Defective Retrovirus," *Cell* 33: 153-159 (1983);
- Markowitz *et al.*, "A Safe Packaging Line for Gene Transfer: Separating Viral Genes on Two Different Plasmids," *J. Virol.* 62: 1120-1124 (1988);
- Marks and Collins, "Characterization of Nicotine Binding in Mouse Brain and Comparison with the Binding of α -Bungarotoxin and Quinuclidinyl Benzilate," *Mol. Pharmacol.* 22: 554 (1982);
- Marks *et al.*, "Nicotinic Binding Sites in Rat and Mouse Brain: Comparison of Acetylcholine, Nicotine, and α -Bungarotoxin," *Mol. Pharmacol.* 30: 427-437 (1986);
- Matter-Sadzinski *et al.*, "Neuronal specificity of the $\alpha 7$ nicotinic acetylcholine receptor promoter develops during morphogenesis of the central nervous system," *EMBO J.* 11: 4529-4538 (1992);
- Maue *et al.*, "Neuron-Specific Expression of the Rat Brain Type II Sodium Channel Gene Is Directed by Upstream Regulatory Elements," *Neuron* 4: 223-231 (1990);
- Melissari *et al.*, "Mitral valve prolapse in a case of Marfan syndrome with congenital cardiac disease, chronic obstructive pulmonary disease and schizophrenia," *Pathologica* 87: 78-81 (1995);
- Miller *et al.*, "A simple salting out procedure for extracting DNA from human nucleated cells," *Nucl. Acids Res.* 16: 1215 (1988);
- Miller and Rosman, "Improved Retroviral Vectors for Gene Transfer and Expression," *BioTechniques* 7: 980-990 (1992);

- Miller and Freeman, "The Activity of Hippocampal Interneurons and Pyramidal Cells During The Response of the Hippocampus to Repeated Auditory Stimuli," *Neurosci.* 69: 371-381 (1995);
- Mizushima and Nagata, "pEF-BOS, a powerful mammalian expression vector," *Nucl. Acids. Res.* 18:5322 (1990);
- Nagamoto *et al.*, "Sensory Gating in Schizophrenics and Normal Controls: Effects of Changing Stimulation Interval," *Biol. Psychiat.* 25: 549-561 (1989);
- Nagamoto *et al.*, "Gating of Auditory P50 in Schizophrenics: Unique Effects of Clozapine," *Biol. Psychiat.* 40: 181-188 (1996);
- Newland *et al.*, "Functional and non-functional isoforms of the human muscle acetylcholine receptor," *J. Physiol.* 489: 767-778 (1995);
- Nielsen *et al.*, "Peptide nucleic acids (PNAs): Potential anti-sense and anti-gene agents," *Anticancer Drug Des.* 8:53-63 (1993);
- Orr-Urtreger *et al.*, "Cloning and Mapping of the Mouse $\alpha 7$ -Neuronal Nicotinic Acetylcholine Receptor," *Genomics* 26: 399-402 (1995);
- Ott, *Analysis of Human Genetic Linkage*, Johns Hopkins University Press, Baltimore (1991);
- Ott, "Computer-simulation methods in human linkage analysis," *Proc. Natl. Acad. Sci. U.S.A.* 86: 4175-2178 (1989);
- Patrick *et al.*, "Molecular Biology of Nicotinic Acetylcholine Receptors," *Ann. NY Acad. Sci.* 505: 194 (1987);
- Pauly *et al.*, "Glucocorticoid Regulation of Sensitivity to Nicotine," in *The Biology of Nicotine: Current Research Issues*, Lippiello *et al.* (eds.), pp. 121-139, Raven Press, New York (1992);
- PCT WO 96/25508;
- PCT WO 96/17823;
- PCT WO 95/21931;
- PCT WO 95/18863;
- PCT WO 96/15244;
- PCT WO 95/07358;
- PCT WO 95/02697;

- PCT WO 94/26914;
- PCT WO 94/21807;
- PCT WO 93/03367;
- PCT WO 92/05263;
- PCT WO 90/02806;
- PCT WO 90/13678;
- PCT WO 89/07150;
- Peng *et al.*, "Human $\alpha 7$ Acetylcholine Receptor: Cloning of the $\alpha 7$ Subunit from the SH-SY5Y Cell Line and Determination of Pharmacological Properties of Native Receptors and Functional $\alpha 7$ Homomers Expressed in *Xenopus* Oocytes," *Mol. Pharm.* 45: 546-554 (1994);
- Pulver *et al.*, "Follow-Up of a Report of a Potential Linkage for Schizophrenia on Chromosome 22q12-q13.1: Part 2," *Am. J. Med. Genet.* 54: 44-50 (1994);
- Research Disclosure 371005A;
- Risch, "Genetic Linkage and Complex Diseases, With Special Reference to Psychiatric Disorders," *Genet. Epidemiol.* 7: 3-16 (1990);
- Rollins *et al.*, "Cellular Localization of α -Bungarotoxin Binding and $\alpha 7$ mRNA in the Hippocampus Related to Auditory Gating in the Awake, Behaving Rat," *Soc. Neurosci. Abst.* 22: 1272 (1996);
- Saksela *et al.*, "Human immunodeficiency virus type 1 mRNA expression in peripheral blood cells predicts disease progression independently of the numbers of CD4⁺ lymphocytes," *Proc. Natl. Acad. Sci. U.S.A.* 91: 1104-1108 (1994);
- Saksela *et al.*, "High Viral Load in Lymph Nodes and Latent Human Immunodeficiency Virus (HIV) in Peripheral Blood Cells of HIV-1 Infected Chimpanzees," *J. Virol.* 67: 7423-7427 (1993);
- Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual*, 2nd ed., pp. 7.39-7.52, 9.31-9.58, 16.6-16.15, Cold Spring Laboratory Press, New York (1989);
- Samulski *et al.*, "A Recombinant Plasmid from Which an Infectious Adeno-Associated Virus Genome Can Be Excised *In Vitro* and Its Use To Study Viral Replication," *J. Virol.* 61: 3096-3101 (1987);

- Samulski *et al.*, "Helper-Free Stocks of Recombinant Adeno-Associated Viruses: Normal Integration Does Not Require Viral Gene Expression," *J. Virol.* 63: 3822-3828 (1989);
- Sauerwald *et al.*, "The 5'-Flanking Region of the Synapsin I Gene," *J. Biol. Chem.* 265: 14932-14937 (1990);
- Schmid, "Alu: Structure, Origin, Evolution, Significance and Function of One-Tenth of Human DNA," *Prog. Nucl. Acid Res.* 53: 283-319 (1996);
- Schoepfer *et al.*, "Brain α -Bungarotoxin Binding Protein cDNAs and MAbs Reveal Subtypes of This Branch of the Ligand-Gated Ion Channel Gene Superfamily," *Neuron* 5: 35-48 (1990);
- Séguéla *et al.*, "Molecular Cloning, Functional Properties, and Distribution of Rat Brain $\alpha 7$: A Nicotinic Cation Channel Highly Permeable to Calcium," *J. Neurosci.* 13: 596-604 (1993);
- Sham *et al.*, "Segregation analysis of complex phenotypes: an application to schizophrenia and auditory P300 latency," *Psychiat. Genet.* 4: 29-38 (1994);
- Siegel *et al.*, "Deficits in Sensory Gating in Schizophrenic Patients and Their Relatives, Evidence Obtained With Auditory Evoked Responses," *Arch. Gen. Psychiat.* 41: 607-612 (1984);
- Silverman *et al.*, "Evidence of a Locus for Schizophrenia and Related Disorders on the Short Arm of Chromosome 5 in a Large Pedigree," *Am. J. Med. Genet.* 67: 162-171 (1996);
- Sirota *et al.*, "Schizophrenia and Marfan Syndrome," *Br. J. Psychiat.* 157: 433-436 (1990);
- Spitzer *et al.*, "Research Diagnostic Criteria, Rationale and Reliability," *Arch. Gen. Psychiat.* 35: 773-782 (1978);
- Stratford-Perricaudet *et al.*, "Widespread Long-term Gene Transfer to Mouse Skeletal Muscles and Heart," *J. Clin. Invest.* 90: 626-630 (1992);
- Tsuang *et al.*, "Long-term Outcome of Major Psychoses I. Schizophrenia and Affective Disorders Compared with Psychiatrically Symptom-Free Surgical Conditions," *Arch. Gen. Psychiat.* 36: 1295-1301 (1979);

- Tsuang *et al.*, "Genotypes, Phenotypes, and the Brain, A Search for Connections in Schizophrenia," *Brit. J. Psychiat.* 163: 299-307 (1993);
- Uetsuki *et al.*, "Isolation and Characterization of the Human Chromosomal Gene for Polypeptide Chain Elongation Factor-1 α ," *J. Biol. Chem.* 264:5791 [1989];
- Ulmer *et al.*, "Heterologous Protection Against Influenza by Injection of DNA Encoding a Viral Protein," *Science* 259: 1745-1748 (1993);
- Vinogradova *et al.*, "Do Semantic Priming Effects Correlate with Sensory Gating in Schizophrenia," *Biol. Psychiat.* 39: 821-824 (1996);
- Vinogradova, in *The Hippocampus 2: Neurophysiology and Behavior*, Issacson and Pribram (eds.), pp. 3-69, Plenum Press, New York, New York (1975);
- von Heijne, "A new method for predicting signal sequence cleavage sites," *Nucl. Acids Res.* 14: 4683-4690 (1986);
- Voss *et al.*, "The role of enhancers in the regulation of cell-type-specific transcriptional control," *Trends Biochem. Sci.* 11:287-289 [1986];
- Wada *et al.*, "Distribution of Alpha2, Alpha3, Alpha4, and Beta2 Neuronal Nicotinic Receptor Subunit mRNAs in the Central Nervous System: A Hybridization Histochemical Study in the Rat," *J. Compar. Neurol.* 284: 314-335 (1989);
- Waldo *et al.*, "Codistribution of a Sensory Gating Deficit and Schizophrenia in Multi-affected Families," *Psychiat. Res.* 39: 257-268 (1991);
- Waldo *et al.*, "Auditory sensory gating, hippocampal volume, and catecholamine metabolism in schizophrenics and their siblings," *Schizophr. Res.* 12: 93-106 (1991);
- Wang *et al.*, "Evidence for a susceptibility locus for schizophrenia on chromosome 6pter-p22," *Nature Genet.* 10: 41-46 (1995);
- Williams *et al.*, "Introduction of foreign genes into tissues of living mice by DNA-coated microprojectiles," *Proc. Natl. Acad. Sci. U.S.A.* 88: 2726-2730 (1991);
- Wilson *et al.*, "Habituation of Human Limbic Neuronal Response to Sensory Stimulation," *Exp. Neurol.* 84: 74-97 (1984);

- Wilson *et al.*, "Hepatocyte-directed Gene Transfer in Vivo Leads to Transient Improvement of Hypercholesterolemia in Low Density Lipoprotein Receptor-deficient Rabbits," *J. Biol. Chem.* 267: 963-967 (1992);
- Wonnacott, " α -Bungarotoxin Binds to Low-Affinity Nicotine Binding Sites in Rat Brain," *J. Neurochem.* 47: 1706-1712 (1986);
- Wu and Wallace, "The Ligation Amplification Reaction (LAR) -- Amplification of Specific DNA Sequences Using Sequential Rounds of Template-Dependent Ligation," *Genomics* 4:560-569 [1989];
- Wu and Wu, "Receptor-mediated Gene Delivery and Expression in Vivo," *J. Biol. Chem.* 263: 14621-14624 (1988);
- Wu and Wu, "Receptor-mediated *in Vitro* Gene Transformation by a Soluble DNA Carrier System," *J. Biol. Chem.* 262: 4429-4432 (1987); and
- Zhang *et al.*, "Neuronal Acetylcholine Receptors That Bind α -Bungarotoxin with High Affinity Function as Ligand-Gated Ion Channels," *Neuron* 12: 167-177 (1994).

Applicants have become aware of the following printed publications which may be material to the examination of this application:

- Doucette-Stamm *et al.*, "Cloning and Sequence of the Human α_7 Nicotinic Acetylcholine Receptor," *Drug Dev. Res.* 30: 252-256 (1993) disclose the isolation and sequence of clones corresponding to the human α_7 nicotinic acetylcholine receptor. Unlike the presently claimed invention, Doucette-Stamm *et al.* do not disclose isolated fragments of the human α_7 sequence, encoded by SEQ ID Nos. 85-103 of the presently claimed invention. Furthermore, Doucette-Stamm *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, comprising the step of hybridizing fragments of the α_7 sequence encoded by SEQ ID Nos. 9-11 and 84-103 of the presently claimed invention to nucleic acid of the biological sample; nor do Doucette-Stamm *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ,

using at least two primers selected from SEQ ID Nos. 1-8 and 12-83 of the presently claimed invention;

- Chini *et al.*, "Molecular Cloning and Chromosomal Localization of the Human $\alpha 7$ -Nicotinic Receptor Subunit Gene (CHRNA7)," *Genomics* 19: 379-381 (1994) disclose nucleotide and amino acid sequences for the human $\alpha 7$ neuronal nicotinic subunit for chromosome 15, band q14 region. Unlike the presently claimed invention, Chini *et al.* do not disclose isolated fragments of the $\alpha 7$ sequence encoded by SEQ ID Nos. 84-103 of the presently claimed invention. Furthermore, Chini *et al.* do not disclose methods for detection of a polynucleotide encoding $\alpha 7$ in a biological sample, comprising the step of hybridizing fragments of the $\alpha 7$ sequence encoded by SEQ ID Nos. 9-11 and 84-103 of the presently claimed invention to nucleic acid of the biological sample; nor do Chini *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding $\alpha 7$, using at least two primers selected from SEQ ID Nos. 1-8 and 12-83 of the presently claimed invention;
- Garcia-Guzman *et al.*, " α -Bungarotoxin-sensitive Nicotinic Receptors on Bovine Chromaffin Cells: Molecular Cloning, Functional Expression and Alternative Splicing of the $\alpha 7$ Subunit," *Eur. J. Neurosci.* 7: 647-655 (1995) disclose that α -bungarotoxin-sensitive acetylcholine receptors from bovine chromaffin cells contain an $\alpha 7$ subunit homologous to those previously cloned from chicks, rats and humans, and show alternative splicing of the $\alpha 7$ subunit transcript. Garcia-Guzman *et al.* do not disclose isolated fragments of the $\alpha 7$ sequence encoded by SEQ ID Nos. 84-103 of the presently claimed invention. Furthermore, Garcia-Guzman *et al.* do not disclose methods for detection of a polynucleotide encoding $\alpha 7$ in a biological sample, comprising the step of hybridizing fragments of the $\alpha 7$ sequence encoded by SEQ ID Nos. 9-11 and 84-103 of the presently claimed invention to nucleic acid of the biological sample; nor do Garcia-Guzman *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding $\alpha 7$,

using at least two primers selected from SEQ ID Nos. 1-8 and 12-83 of the presently claimed invention;

- Anand and Lindstrom, "Nucleotide sequence of the human nicotinic acetylcholine receptor β_2 subunit gene," *Nuc. Acids Res.* 18: 4272 (1990) disclose the nucleotide sequence of human acetylcholine receptor β_2 subunit gene. Unlike the presently claimed invention, Anand and Lindstrom do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Anand and Lindstrom do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Anand and Lindstrom disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Deneris *et al.*, "Primary Structure and Expression of β_2 : A Novel Subunit of Neuronal Nicotinic Acetylcholine Receptors," *Neuron* 1: 45-54 (1988) disclose the β_2 subunit of the neuronal receptor family. Unlike the presently claimed invention, Deneris *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Deneris *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Deneris *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Fornasari *et al.*, "Structural and Functional Characterization of the Human α_3 Nicotinic Subunit Gene Promoter," *Mol. Pharmacol.* 51: 250-261 (1997) disclose the structural and functional features of the human α_3 nicotinic receptor subunit promoter, and investigate the tissue-specific activity of the human α_3 gene 5' regulatory sequences. Unlike the presently claimed invention, Fornasari *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Fornasari *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Fornasari *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ; and

- Fornasari *et al.*, "Molecular cloning of human neuronal nicotinic receptor α_3 -subunit," *Neurosci. Lett.* 111: 351-356 (1990) disclose a protein showing high homology to rat α_3 neuronal nicotinic receptor, and identify this protein as the human α_3 -nicotinic subunit. Unlike the presently claimed invention, Fornasari *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Fornasari *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Fornasari *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 .

Applicants have included the following publications in which the inventors are co-authors. These publications, while not prior art, have been included for completeness:

- Gault *et al.*, "Genomic Organization and Partial Duplication of the Human α_7 Neuronal Nicotinic Acetylcholine Receptor Gene (CHRNA7), *Genomics* 52: 173-185 (1998) disclose the cloning, sequencing, and characterization of a putative promoter 5' of the translation start in exon 1 of the human α_7 neuronal nicotinic acetyl receptor gene;
- Leonard *et al.*, "Linkage of a chromosome 15 locus to a neurophysiological deficit in schizophrenia," *Am. J. Human Genet.* 59: A225 (1996) investigate an inhibitory neuronal mechanism which regulates response to auditory stimuli, and suggest that the α_7 neuronal nicotinic receptor is a candidate gene in this pathway. Unlike the presently claimed invention, Leonard *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Leonard *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Leonard *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Breese *et al.*, "Comparison of the Regional Expression of Nicotinic Acetylcholine Receptor α_7 mRNA and [125 I]- α -bungarotoxin binding in Human Postmortem Brain," *J. Comp. Neurol.* 387: 385-398 (1997) compare the expression of α_7 mRNA and the localization of bungarotoxin binding sites in

human brain. Unlike the presently claimed invention, Breese *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Breese *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Breese *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;

- Leonard *et al.*, "Genomic Structure of the Human α_7 Neuronal Nicotinic Acetylcholine Receptor Subunit," *Abstracts, Society for Neuroscience*, 27th Annual Meeting, October 25-30 (1997) disclose the genomic structure for the human α_7 gene (*i.e.*, exon/intron borders, promoter, and 3'-UT sequence). Unlike the presently claimed invention, Leonard *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Leonard *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Leonard *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Freedman *et al.*, "Linkage of a neurophysiological deficit in schizophrenia to a chromosome 15 locus," *Proc. Natl. Acad. Sci. U.S.A.* 94: 587-592 (1997) disclose that a defect in a neuronal mechanism which regulates response to auditory stimuli is linked to a dinucleotide polymorphism at chromosome 15q13-14, the site of the α_7 nicotinic receptor. Unlike the presently claimed invention, Freedman *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Freedman *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Freedman *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Logel *et al.*, "Expression of High and Low Affinity Neuronal Nicotinic Receptors in Tissues of Neural Crest Origin," *Abstracts, Society for Neuroscience*, 27th Annual Meeting, October 25-30 (1997) investigate the expression of neuronal nicotine receptor subunits in cells of neural crest origin, and suggest that specific subunits of the neuronal nicotinic receptors are present

in peripheral tissues of neural crest origin. Unlike the presently claimed invention, Logel *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Logel *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Logel *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;

- Breese *et al.*, "Abnormal Regulation of High Affinity Nicotinic Receptor Binding in Schizophrenics," *Abstracts, Society for Neuroscience*, 27th Annual Meeting, October 25-30 (1997) disclose the possibility of an alteration in the regulation of high affinity nicotinic receptor expression by nicotine use in schizophrenia. Unlike the presently claimed invention, Breese *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Breese *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Breese *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Gault *et al.*, "Contig construction across the 15q14 schizophrenia linkage region and candidate gene characterization of the partially duplicated α_7 nicotinic receptor," *Am. J. Human Genet.* 63: A249 (1998) disclose the assembly of a contig across the 15q14 schizophrenia linkage region, which includes the α_7 nicotinic acetylcholine receptor gene, and investigate this region's linkage to the schizophrenia phenotype. Unlike the presently claimed invention, Gault *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Gault *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Gault *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Leonard *et al.*, "Additional evidence for a chromosome 15 locus in schizophrenia: Analysis of affected sibpairs from the NMH genetics initiative," *Am. J. Human Genet.* 63: A297 (1998) investigate the presence of a dinucleotide-repeat marker, D15S1360, containing the coding region of α_7

neuronal nicotinic acetylcholine receptor gene in affected sibpairs from the NIMH genetics initiative. Unlike the presently claimed invention, Leonard *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Leonard *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Leonard *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;

- Leonard *et al.*, "Further Investigation of a Chromosome 15 Locus in Schizophrenia: Analysis of Affected Sibpairs From the NIMH Genetics Initiative," *Am. J. Med. Genet.* 81: 308-312 (1998) disclose that analysis of affected sibpairs from the NIMH Genetics Initiative shows a significant proportion of D15S1360 alleles shared identical-by-descent, and gives support for the involvement of this chromosomal locus in the genetic transmission of schizophrenia. Unlike the presently claimed invention, Leonard *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Leonard *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Leonard *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Zetterström *et al.*, "Polymorphisms at the Calcitonin/CGRP- α Gene Locus: Investigation of Possible Associations with Neurological or Psychiatric Disease," *Abstracts, Society for Neuroscience*, 28th Annual Meeting, November 7-12 (1998) investigate possible associations of polymorphisms (*i.e.*, single nucleotide polymorphisms, deletion and missense mutation) with neurological or psychiatric diseases such as bipolar affective disorder, Parkinson's disease and schizophrenia. Unlike the presently claimed invention, Zetterström *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Zetterström *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Zetterström *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;

- Drebing *et al.*, "Expression of the Human α_7 Neuronal Nicotinic Acetylcholine Receptor and a Partial Gene Duplication," *Abstracts, Society for Neuroscience*, 28th Annual Meeting, November 7-12 (1998) disclose that human α_7 neuronal nicotinic receptor can be detected in cycloheximide treated immortalized lymphocytes by ectopic PCR. Unlike the presently claimed invention, Drebing *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Drebing *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Drebing *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Leonard *et al.*, "Genomic Organization and Partial Duplication of the Human α_7 Neuronal Nicotinic Acetylcholine Receptor Subunit Gene," *Abstracts, Society for Neuroscience*, 28th Annual Meeting, November 7-12 (1998) disclose the cloning, sequencing, and characterization of a putative promoter 5' of the translation start in exon 1 of the human α_7 neuronal nicotinic acetyl receptor gene. Unlike the presently claimed invention, Leonard *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Leonard *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Leonard *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Dudek *et al.*, "Expression in Human Brain of Novel Exons Associated with a Partial Duplication of the α_7 Neuronal Nicotinic Receptor," *Abstracts, Society for Neuroscience*, 28th Annual Meeting, November 7-12 (1998) disclose that proximal to the full-length human α_7 neuronal nicotinic receptor subunit gene, exons 5 to 10 have been duplicated with intervening intron sequences, and four novel exons A, B, C and D were found 5' to exon 5 in the duplication clones. Unlike the presently claimed invention, Dudek *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Dudek *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Dudek *et al.* disclose


methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;

- Breese *et al.*, "Abnormal Regulation of the High Affinity Nicotinic Receptors in Schizophrenia," *Abstracts, Society for Neuroscience*, 28th Annual Meeting, November 7-12 (1998) characterize [3 H]-epibatidine, a novel nicotinic receptor ligand in human postmortem brain, and give support that an abnormality in the regulation of the high affinity neuronal nicotinic receptors may be involved in the neuropathophysiology of schizophrenia through studies comparing nicotinic receptor binding in the cortex and caudate areas. Unlike the presently claimed invention, Breese *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Breese *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Breese *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ;
- Lee *et al.*, "The Effect of Nicotine and Haloperidol on High Affinity Nicotinic Receptors and Dopamine D2 Receptors in the Rat Brain," *Abstracts, Society for Neuroscience*, 28th Annual Meeting, November 7-12 (1998) disclose that haloperidol has no effect on nicotine induced upregulation of nicotinic binding in rat, and suggest that decreased nicotine binding in brains of schizophrenic smokers is not due to chronic treatment with typical neuroleptics. Unlike the presently claimed invention, Lee *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Lee *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Lee *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 ; and
- Adler *et al.*, "Schizophrenia, Sensory Gating, and Nicotinic Receptors," *Schizophrenia Bulletin* 24: 189-202 (1998) summarize findings implicating the α_7 -nicotinic receptor in schizophrenia, and discuss implications for the pathogenesis of schizophrenia that arise from studies of α_7 -nicotinic receptor effects on cell growth and differentiation. Unlike the presently claimed

invention, Adler *et al.* do not disclose isolated nucleotide sequences encoding a portion of the human α_7 nicotinic receptor. Furthermore, Adler *et al.* do not disclose methods for detection of a polynucleotide encoding α_7 in a biological sample, nor do Adler *et al.* disclose methods for amplification of nucleic acid from a sample suspected of containing nucleic acid encoding α_7 .

This Information Disclosure Statement under 37 C.F.R. §§ 1.56 and 1.97 is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that any one or more of these citations constitutes prior art.

Dated: March 29, 1999


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FORM PTO-1449 (Modified)		U.S. Department of Commerce Patent and Trademark Office		Attorney Docket No.: UTC-03042	Serial No.: 08/956,518
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use Several Sheets if Necessary) APR - 2 1999				Applicant: Sherry Leonard <i>et al.</i>	
(37 CFR § 1.98(b))				Filing Date: 10/23/97	Group Art Unit: 1645

U.S. PATENT DOCUMENTS							
Examiner Initials	Cite No.	Serial / Patent Number	Issue Date	Applicant / Patentee	Class	Subclass	Filing Date
	1	5,589,466	12/31/96	Felgner <i>et al.</i>			1/26/95
	2	5,580,859	12/3/96	Felgner <i>et al.</i>			3/18/94
	3	5,459,127	10/17/95	Felgner <i>et al.</i>			9/16/93
	4	5,399,346	3/21/95	Anderson <i>et al.</i>			3/30/94
	5	5,322,770	6/21/94	Gelfand			12/22/89
	6	5,124,263	6/23/92	Temin <i>et al.</i>			1/12/89
	7	4,980,289	12/25/90	Temin <i>et al.</i>			4/27/87
	8	4,965,188	10/23/90	Mullis <i>et al.</i>			6/17/87
	9	4,946,778	8/7/90	Ladner <i>et al.</i>			1/19/89
	10	4,861,719	8/29/89	Miller			4/25/86
	11	4,683,202	7/28/87	Mullis			10/25/85
	12	4,683,195	7/28/87	Mullis <i>et al.</i>			2/7/86
	13	4,650,764	3/17/87	Temin <i>et al.</i>			3/26/84

FOREIGN PATENTS OR PUBLISHED FOREIGN PATENT APPLICATIONS								
		Document Number	Publication Date	Country / Patent Office	Class	Subclass	Translation	
							Yes	No
✓	14	WO 96/25508	8/22/96	France				
✓	15	WO 96/17823	6/13/96	France				
✓	16	WO 95/21931	8/17/95	France				
✓	17	WO 95/18863	7/13/95	France				
✓	18	WO 96/15244	5/23/96	United States				
✓	19	WO 95/07358	3/16/95	United States				
✓	20	WO 95/02697	1/26/95	France				
✓	21	WO 94/26914	11/24/94	France				
✓	22	WO 94/21807	9/29/94	Great Britain				
✓	23	WO 93/03367	2/18/93	United States				
✓	24	WO 92/05263	4/2/92	Great Britain				
✓	25	WO 90/02806	3/22/90	United States				
✓	26	WO 90/13678	11/15/90	United States				
✓	27	WO 89/07150	8/10/89	United States				
✓	28	EP 0453243A2	10/23/91	European Patent Office				
✓	29	EP 0178220 B1	4/16/86	European Patent Office				

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				Filing Date: 10/23/97		Group Art Unit: 1645	
OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)							
✓	30	Adler <i>et al.</i> , "Normalization by Nicotine of Deficient Auditory Sensory Gating in the Relatives of Schizophrenics," <i>Biol. Psych.</i> 32: 607-616 (1992);					
✓	31	Adler <i>et al.</i> , "Normalization of Auditory Physiology by Cigarette Smoking in Schizophrenic Patients," <i>Am. J. Psychol.</i> 150: 1856-1861 (1993);					
✓	32	Adler <i>et al.</i> , "Neurophysiological Studies of Sensory Gating in Rats: Effects of Amphetamine, Phencyclidine, and Haloperidol," <i>Biol. Psychiat.</i> 21: 787-798 (1986);					
✓	33	Adler <i>et al.</i> , "Neurophysiological Evidence for a Defect in Neuronal Mechanisms Involved in Sensory Gating in Schizophrenia," <i>Biol. Psychiat.</i> 17: 639-654 (1982);					
✓	34	Albertsen <i>et al.</i> , "Construction and characterization of a yeast artificial chromosome library containing seven haploid human genome equivalents," <i>Proc. Natl. Acad. Sci.</i> 87: 4256-4260 (1990);					
✓	35	Alkondon and Albuquerque, "Diversity of Nicotinic Acetylcholine Receptors in Rat Hippocampal Neurons. I. Pharmacological and Functional Evidence for Distinct Structural Subtypes," <i>J. Pharm. Ex. Ther.</i> 265: 1455-1473 (1993);					
✓	36	Amar <i>et al.</i> , "Agonist pharmacology of the neuronal $\alpha 7$ nicotinic receptor expressed in <i>Xenopus</i> oocytes," <i>FEBS</i> 327: 284-288 (1993);					
✓	37	Anderson and Young, "Quantitative Filter Hybridization," in <i>Nucleic Acid Hybridization A Practical Approach</i> , Hames and Higgins (eds.), pp. 73-109, IRL Press (1985);					
✓	38	Barnes, "PCR Amplification of up to 35-kb DNA with high fidelity and high yield from λ bacteriophage templates," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 91: 2216-2220 (1994);					
✓	39	Beard <i>et al.</i> , "Transcription Mapping of Mouse Adenovirus Type 1 Early Region 3," <i>Virology</i> , pp. 75-81 (1990);					
✓	40	Beeson <i>et al.</i> , "The human muscle nicotinic acetylcholine receptor α -subunit exists as two isoforms: a novel exon," <i>EMBO J.</i> 9: 2101-2106 (1990);					
✓	41	Bender <i>et al.</i> , "Evidence that the Packaging Signal of Moloney Murine Leukemia Virus Extends into the <i>gag</i> Region," <i>J. Virol.</i> 61: 1639-1646 (1987);					
✓	42	Bernstein <i>et al.</i> , "Gene Transfer with Retrovirus Vectors," <i>Genet. Eng.</i> 7: 235-261 (1985);					
✓	43	Bessis <i>et al.</i> , "Negative regulatory elements upstream of a novel exon of the neuronal nicotinic acetylcholine receptor of $\alpha 2$ subunit gene," <i>Nucl. Acids Res.</i> 21: 2185-2192 (1993);					
✓	44	Bickford-Wimer <i>et al.</i> , "Auditory Sensory Gating in Hippocampal Neurons: A Model System in the Rat," <i>Biol. Psychiat.</i> 27: 183-192 (1990);					
✓	45	Bickford and Wear, "Restoration of sensory gating of auditory evoked response by nicotine in fimbria-fornix lesioned rats," <i>Brain Res.</i> 705: 235-240 (1995);					
✓	46	Biedler <i>et al.</i> , "Multiple Neurotransmitter Synthesis by Human Neuroblastoma Cell Lines and Clones," <i>Cancer Res.</i> 38: 3751-3757 (1978);					
✓	47	Blount and Merlie, "Mutational Analysis of Muscle Nicotinic Acetylcholine Receptor Subunit Assembly," <i>J. Cell Biol.</i> 111: 2613-2622 (1990);					
✓	48	Boshart <i>et al.</i> , "A Very Strong Enhancer is Located Upstream of an Immediate Early Gene of Human Cytomegalovirus," <i>Cell</i> 41:521-530 (1985);					
✓	49	Boutros and Overall, "Replication and Extension of P50 Findings in Schizophrenia," <i>Clin. Electroencephalog.</i> 22: 40-45 (1991);					
✓	50	Braff <i>et al.</i> , "Gating and Habituation of the Startle Reflex in Schizophrenic Patients," <i>Arch. Gen. Psychiat.</i> 49: 206-215 (1992);					
✓	51	Breier <i>et al.</i> , "National Institute of Mental Health Longitudinal Study of Chronic Schizophrenia, Prognosis and Predictors of Outcome," <i>Arch. Gen. Psychiat.</i> , 48: 239-246 (1991);					
✓	52	Brownstein <i>et al.</i> , "Isolation of Single-Copy Human Genes from a Library of Yeast Artificial Chromosome Clones," <i>Science</i> 244: 1348-1351 (1989);					
✓	53	Burke <i>et al.</i> , "Cloning of Large Segments of Exogenous DNA into Yeast by Means of Artificial Chromosome Vectors," <i>Science</i> 236: 806-812 (1987);					
✓	54	Calzolari <i>et al.</i> , "Psychiatric Disorder in a Familial 15;18 Translocation and Sublocalization of Myelin Basic Protein to 18q22.3," <i>Am. J. Med. Genet.</i> 67: 154-161 (1996);					
Examiner:				Date Considered:			
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

FORM PTO-1449 (Modified)		U.S. Department of Commerce Patent and Trademark Office		Attorney Docket No.: UTC-03042	Serial No.: 08/956,518
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				Filing Date: 10/23/97	
OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)					
✓	55	Cameron <i>et al.</i> , "Dendritic Cells Exposed to Human Immunodeficiency Virus Type-1 Transmit a Vigorous Cytopathic Infection to CD4 ⁺ T Cells," <i>Science</i> 257: 383-387 (1992);			
✓	56	Casaubon <i>et al.</i> , "The Gene Responsible for a Severe Form of Peripheral Neuropathy and Agenesis of the Corpus Callosum Maps to Chromosome 15q," <i>Am. J. Hum. Genet.</i> 58: 28-34 (1996);			
✓	57	Chamberlin <i>et al.</i> , "New RNA Polymerase from <i>Escherichia coli</i> infected with Bacteriophage T7," <i>Nature</i> 228:227-231 (1970);			
✓	58	Chomczynski and Sacchi, "Single-Step Method of RNA Isolation by Acid Guanidinium Thiocyanate-Phenol-Chloroform Extraction," <i>Anal. Biochem.</i> 162: 156-159 (1987);			
✓	59	Chumakov <i>et al.</i> , "Continuum of overlapping clones spanning the entire human chromosome 21q," <i>Nature</i> 359: 380-386 (1992);			
✓	60	Clarke, "Prader-Willi Syndrome and Psychoses," <i>Brit. J. Psychiat.</i> 163: 680-684 (1993);			
✓	61	Cole <i>et al.</i> , "The EBV-Hybridoma Technique and its Application to Human Lung Cancer," in <i>Monoclonal Antibodies and Cancer Therapy</i> , Reisfeld <i>et al.</i> (eds.), pp. 77-96, Alan R. Liss, Inc. (1985);			
✓	62	Conti-Tronconi <i>et al.</i> , "Brain and muscle nicotinic acetylcholine receptors are different but homologous proteins," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 82: 5208-5212 (1985);			
✓	63	Coon <i>et al.</i> , "Search for Mutations in the $\beta 1$ GABA _A Receptor Subunit Gene in Patients with Schizophrenia," <i>Am. J. Med. Genet.</i> 54: 12-20 (1994);			
✓	64	Coon <i>et al.</i> , "Use of a Neurophysiological Trait in Linkage Analysis of Schizophrenia," <i>Biol. Psychiat.</i> 34: 277-289 (1993);			
✓	65	Cooper <i>et al.</i> , "Pentameric structure and subunit stoichiometry of a neuronal nicotinic acetylcholine receptor," <i>Nature</i> 350: 235-238 (1991);			
✓	66	Cote <i>et al.</i> , "Generation of human monoclonal antibodies reactive with cellular antigens," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 80: 2026-2030 (1983);			
✓	67	Couturier <i>et al.</i> , "A Neuronal Nicotinic Acetylcholine Receptor Subunit ($\alpha 7$) Is Developmentally Regulated and Forms a Homo-Oligomeric Channel Blocked by α -BTX," <i>Neuron</i> 5: 847-856 (1990);			
✓	68	Cullum <i>et al.</i> , "Neurophysiological and neuropsychological evidence for attentional dysfunction in schizophrenia," <i>Schizophrenia Res.</i> 10: 131-141 (1993);			
✓	69	Curiel <i>et al.</i> , "High-Efficiency Gene Transfer Mediated by Adenovirus Coupled to DNA-Polylysine Complexes," <i>Hum. Gene Ther.</i> 3: 147-154 (1992);			
✓	70	De Amicis <i>et al.</i> , "Reaction Time Crossover as a Marker of Schizophrenia and of Higher Functioning," <i>J. Nerv. Ment. Dis.</i> 174: 177-179 (1986);			
✓	71	deLeon <i>et al.</i> , "Schizophrenia and Smoking: An Epidemiological Survey in a State Hospital," <i>Am. J. Psychiat.</i> 152: 453-455 (1995);			
✓	72	Den-Dunnen <i>et al.</i> , "Topography of the Duchenne Muscular Dystrophy (DMD) Gene: FIGE and cDNA Analysis of 194 Cases Reveals 115 Deletions and 13 Duplications," <i>Am. J. Hum. Genet.</i> 45: 835-847 (1989);			
✓	73	Deneris <i>et al.</i> , "Genes Encoding Neuronal Nicotinic Acetylcholine Receptors," <i>Clin. Chem.</i> 35: 731-737 (1989);			
✓	74	Dijkema <i>et al.</i> , "Cloning and expression of the chromosomal immune interferon gene of the rat," <i>EMBO J.</i> 4:761-767 [1985];			
✓	75	Dominguez del Toro <i>et al.</i> , "Immunocytochemical Localization of the $\alpha 7$ Subunit of the Nicotinic Acetylcholine Receptor in the Rat Central Nervous System," <i>J. Comp. Neurol.</i> 349: 325-342 (1994);			
??	76	Dracopoli <i>et al.</i> , <i>Current Protocols in Human Genetics</i> , John Wiley & Sons, Inc., New York, New York (1994) (Will provide Title and Copyright pages at a later date should the Examiner desire a copy);			
✓	77	Eaton, "Epidemiology of Schizophrenia," <i>Epidemiol. Rev.</i> 7: 105-126 (1985);			
✓	78	Elgoyhen <i>et al.</i> , " $\alpha 9$: An Acetylcholine Receptor with Novel Pharmacological Properties Expressed in Rat Cochlear Hair Cells," <i>Cell</i> 79: 705-715 (1994);			
✓	79	Erlich (ed.), <i>PCR Technology</i> , Stockton Press (1989);			
✓	80	Endicott and Spitzer, "A Diagnostic Interview, The Schedule for Affective Disorders and Schizophrenia," <i>Arch. Gen. Psychiat.</i> 35: 837-844 (1978);			
✓	81	Erwin <i>et al.</i> , "Midlatency Auditory Evoked Responses in Schizophrenia," <i>Biol. Psychiat.</i> 30: 430-442 (1991);			
Examiner:			Date Considered:		
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.					

FORM PTO-1449 (Modified)		U.S. Department of Commerce Patent and Trademark Office		Attorney Docket No.: UTC-03042	Serial No.: 08/956,518
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use Several Sheets If Necessary) (37 CFR § 1.98(d))				Applicant: Sherry Leonard <i>et al.</i>	
				Filing Date: 10/23/97	Group Art Unit: 1645
OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)					
✓	82	Felgner and Ringold, "Cationic liposome-mediated transfection," <i>Nature</i> 337: 387-388 (1989);			
✓	83	Felgner <i>et al.</i> , "Lipofection: A highly efficient, lipid-mediated DNA-transfection procedure," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 84: 7413-7417 (1987);			
Dup ✓	84	Freedman <i>et al.</i> , "α-Bungarotoxin Binding to Hippocampal Interneurons: Immunocytochemical Characterization and Effects on Growth Factor Expression," <i>J. Neurosci.</i> 13: 1965-1975 (1993);			
Dup ✓	85	Freedman <i>et al.</i> , "Elementary neuronal dysfunctions in schizophrenia," <i>Schiz. Res.</i> 4: 233-243 (1991);			
✓	86	Freedman <i>et al.</i> , "Schizophrenia and Nicotinic Receptors," <i>Harvard Rev. Psychiat.</i> 2: 179-192 (1994);			
Dup ✓	87	Freedman <i>et al.</i> , "Evidence in Postmortem Brain Tissue for Decreased Numbers in Hippocampal Nicotinic Receptors in Schizophrenia," <i>Biol. Psychiat.</i> 38: 22-33 (1995);			
2, 2 ✓	88	Frohmman, <i>Amplifications</i> 5: 11 (1990); Reference could not obtained at this time. Will provide reference at a later date should the Examiner desire a copy.			
✓	89	Galzi <i>et al.</i> , "Functional Architecture of the Nicotinic Acetylcholine Receptor: From Electric Organ to Brain," <i>Ann. Rev. Pharmacol.</i> 31: 37-72 (1991);			
✓	90	Goff <i>et al.</i> , "Cigarette Smoking in Schizophrenia: Relationship to Psychopathology and Medication Side Effects," <i>Am. J. Psychiat.</i> 149: 1189-1194 (1992);			
✓	91	Goff <i>et al.</i> , "Neural Origins of Long Latency Evoked Potentials Recorded from the Depth and from the Cortical Surface of the Brain in Man," <i>Prog. Clin. Neurophysiol.</i> 7: 126-145 (1980);			
✓	92	Goldman <i>et al.</i> , "Members of a Nicotinic Acetylcholine Receptor Gene Family Are Expressed in Different Regions of the Mammalian Central Nervous System," <i>Cell</i> 48: 965-973 (1987);			
✓	93	Gorman <i>et al.</i> , "The Rous sarcoma virus long terminal repeat is a strong promoter when introduced into a variety of eukaryotic cells by DNA-mediated transfection," <i>Proc. Natl. Acad. Sci. USA</i> 79: 6777-6781 [1982];			
✓	94	Graham and van der Eb, "A New Technique for the Assay of Infectivity of Human Adenovirus 5 DNA," <i>Virology</i> 52: 456-467 [1973];			
✓	95	Green, "Biochemical Mechanisms of Constitutive and Regulated Pre-mRNA Splicing," <i>Ann. Rev. Cell. Biol.</i> 7: 559-599 (1991);			
✓	96	Griffith <i>et al.</i> , "Effects of sound intensity on a midlatency evoked response to repeated auditory stimuli in schizophrenic and normal subjects," <i>Psychophysiology</i> 32: 460-466 (1995);			
✓	97	Hamera <i>et al.</i> , "Alcohol, Cannabis, Nicotine, and Caffeine Use and Symptom Distress in Schizophrenia," <i>J. Nerv. Mental Dis.</i> 183: 559-565 (1995);			
✓	98	Harlow and Lane, <i>Antibodies: A Laboratory Manual</i> , Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York;			
Dup ✓	99	Hershrman <i>et al.</i> , "GABA _B antagonists diminish the inhibitory gating of auditory response in the rat hippocampus," <i>Neurosci. Lett.</i> 190: 133-136 (1995);			
✓	100	Holzman <i>et al.</i> , "A Single Dominant Gene Can Account for Eye Tracking Dysfunctions and Schizophrenia in Offspring of Discordant Twins," <i>Arch. Gen. Psychiat.</i> 45: 641-647 (1988);			
✓	101	Hu and Worton, "Partial Gene Duplication as a Cause of Human Disease," <i>Hum. Mutat.</i> 1: 3-12 (1992);			
✓	102	Huse <i>et al.</i> , "Generation of a Large Combinatorial Library of the Immunoglobulin Repertoire in Phage Lambda," <i>Science</i> 246: 1275-1281 (1989);			
✓	103	Hyman, "Schizophrenia," in <i>Scientific American Medicine</i> , 13 VII: 1-5, Dale and Federman (eds.), New York, New York (1994);			
✓	104	Judd <i>et al.</i> , "Sensory Gating Deficits in Schizophrenia: New Results," <i>Am. J. Psychiat.</i> 149: 488-493 (1992);			
✓	105	Kacian <i>et al.</i> , "A Replicating RNA Molecule Suitable for a Detailed Analysis of Extracellular Evolution and Replication," <i>Proc. Natl. Acad. Sci. USA</i> 69: 3038-3042 [1972];			
✓	106	Kaplitt <i>et al.</i> , "Expression of a Functional Foreign Gene in Adult Mammalian Brain following <i>in Vivo</i> Transfer via a Herpes Simplex Virus Type 1 Defective Viral Vector," <i>Mol. Cell. Neurosci.</i> 2: 320-330 (1991);			
✓	107	Kim <i>et al.</i> , "Use of the human elongation factor 1α promoter as a versatile and efficient expression system," <i>Gene</i> 91:217-223 [1990];			
✓	108	Kohler and Milstein, "Continuous cultures of fused cells secreting antibody of predefined specificity," <i>Nature</i> 256: 495-497 [1975];			
Examiner:			Date Considered:		
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.					

FORM PTO-1449
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Filing Date: 10/23/97

Group Art Unit: 1645

OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)

- | | | |
|---|-----|---|
| ✓ | 109 | Kozbor <i>et al.</i> , "The production of monoclonal antibodies from human lymphocytes," <i>Immun. Today</i> 4: 72-79 (1983); |
| ✓ | 110 | Kruglyak <i>et al.</i> , "Parametric and Nonparametric Linkage Analysis: A Unified Multipoint Approach," <i>Am. J. Hum. Genet.</i> 58: 1347-1363 (1996); |
| ✓ | 111 | Kuo <i>et al.</i> , "Efficient Gene Transfer Into Primary Murine Lymphocytes Obviating the Need for Drug Selection," <i>Blood</i> 82: 845-852 (1993); |
| ✓ | 112 | Lamond, "The Spliceosome," <i>BioEssays</i> 15: 595-603 (1993); |
| ✓ | 113 | La Salle <i>et al.</i> , "An Adenovirus Vector for Gene Transfer into Neurons and Glia in the Brain," <i>Science</i> 259: 988-990 (1993); |
| ✓ | 114 | Lathrop <i>et al.</i> , "Strategies for multilocus linkage analysis in humans," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 81: 3443-3446 (1984); |
| ✓ | 115 | Lebkowski <i>et al.</i> , "Adeno-Associated Virus: a Vector System for Efficient Introduction and Integration of DNA into a Variety of Mammalian Cell Types," <i>Mol. Cell. Biol.</i> 8: 3988-3996 (1988); |
| ✓ | 116 | Lehrman <i>et al.</i> , "Duplication of Seven Exons in LDL Receptor Gene Caused by Alu-Alu Recombination in a Subject with Familial Hypercholesterolemia," <i>Cell</i> 48: 827-835 (1987); |
| ✓ | 117 | Lindstrom <i>et al.</i> , "Neuronal Nicotinic Receptor Subtypes," <i>Ann. NY Acad. Sci.</i> 757: 100-116 (1996); |
| ✓ | 118 | Lukas and Bencherif, "Heterogeneity and Regulation of Nicotinic Acetylcholine Receptors," <i>Int. Rev. Neurobiol.</i> 34: 25-131 (1992); |
| ✓ | 119 | Luntz-Leybman <i>et al.</i> , "Cholinergic gating of response to auditory stimuli in rat hippocampus," <i>Brain. Res.</i> 587: 130-136 (1992); |
| ✓ | 120 | Machy <i>et al.</i> , "Gene transfer from targeted liposomes to specific lymphoid cells by electroporation," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 85: 8027-8031 (1988); |
| ✓ | 121 | Mäkelä <i>et al.</i> , "Whole-head mapping of middle-latency auditory evoked magnetic fields," <i>Electroencephalogr. Clin. Neurophysiol.</i> 92: 414-421 (1994); |
| ✓ | 122 | Maniatis <i>et al.</i> , "Regulation of Inducible and Tissue-Specific Gene Expression," <i>Science</i> 236: 1237-1244 (1987); |
| ✓ | 123 | Mann <i>et al.</i> , "Construction of a Retrovirus Packaging Mutant and Its Use to Produce Helper-Free Defective Retrovirus," <i>Cell</i> 33: 153-159 (1983); |
| ✓ | 124 | Markowitz <i>et al.</i> , "A Safe Packaging Line for Gene Transfer: Separating Viral Genes on Two Different Plasmids," <i>J. Virol.</i> 62: 1120-1124 (1988); |
| ✓ | 125 | Marks and Collins, "Characterization of Nicotine Binding in Mouse Brain and Comparison with the Binding of α -Bungarotoxin and Quinuclidinyl Benzilate," <i>Mol. Pharmacol.</i> 22: 554 (1982); |
| ✓ | 126 | Marks <i>et al.</i> , "Nicotinic Binding Sites in Rat and Mouse Brain: Comparison of Acetylcholine, Nicotine, and α -Bungarotoxin," <i>Mol. Pharmacol.</i> 30: 427-437 (1986); |
| ✓ | 127 | Matter-Sadzinski <i>et al.</i> , "Neuronal specificity of the $\alpha 7$ nicotinic acetylcholine receptor promoter develops during morphogenesis of the central nervous system," <i>EMBO J.</i> 11: 4529-4538 (1992); |
| ✓ | 128 | Maue <i>et al.</i> , "Neuron-Specific Expression of the Rat Brain Type II Sodium Channel Gene Is Directed by Upstream Regulatory Elements," <i>Neuron</i> 4: 223-231 (1990); |
| ✓ | 129 | Melissari <i>et al.</i> , "Mitral valve prolapse in a case of Marfan syndrome with congenital cardiac disease, chronic obstructive pulmonary disease and schizophrenia," <i>Pathologica</i> 87: 78-81 (1995); |
| ✓ | 130 | Miller <i>et al.</i> , "A simple salting out procedure for extracting DNA from human nucleated cells," <i>Nucl. Acids Res.</i> 16: 1215 (1988); |
| ✓ | 131 | Miller and Rosman, "Improved Retroviral Vectors for Gene Transfer and Expression," <i>BioTechniques</i> 7: 980-990 (1992); |
| ✓ | 132 | Miller and Freeman, "The Activity of Hippocampal Interneurons and Pyramidal Cells During The Response of the Hippocampus to Repeated Auditory Stimuli," <i>Neurosci.</i> 69: 371-381 (1995); |
| ✓ | 133 | Mizushima and Nagata, "pEF-BOS, a powerful mammalian expression vector," <i>Nucl. Acids. Res.</i> 18:5322 (1990); |
| ✓ | 134 | Nagamoto <i>et al.</i> , "Sensory Gating in Schizophrenics and Normal Controls: Effects of Changing Stimulation Interval," <i>Biol. Psychiat.</i> 25: 549-561 (1989); |
| ✓ | 135 | Nagamoto <i>et al.</i> , "Gating of Auditory P50 in Schizophrenics: Unique Effects of Clozapine," <i>Biol. Psychiat.</i> 40: 181-188 (1996); |

Examiner:

Date Considered:

EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449 (Modified)		U.S. Department of Commerce Patent and Trademark Office		Attorney Docket No.: UTC-03042	Serial No.: 08/956,518
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				Filing Date: 10/23/97	Group Art Unit: 1645
OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)					
✓	136	Newland <i>et al.</i> , "Functional and non-functional isoforms of the human muscle acetylcholine receptor," <i>J. Physiol.</i> 489: 767-778 (1995);			
✓	137	Nielsen <i>et al.</i> , "Peptide nucleic acids (PNAs): Potential anti-sense and anti-gene agents," <i>Anticancer Drug Des.</i> 8:53-63 (1993);			
✓	138	Orr-Urtreger <i>et al.</i> , "Cloning and Mapping of the Mouse $\alpha 7$ -Neuronal Nicotinic Acetylcholine Receptor," <i>Genomics</i> 26: 399-402 (1995);			
✓	139	Ott, <i>Analysis of Human Genetic Linkage</i> , Johns Hopkins University Press, Baltimore (1991);			
✓	140	Ott, "Computer-simulation methods in human linkage analysis," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 86: 4175-2178 (1989);			
✓	141	Patrick <i>et al.</i> , "Molecular Biology of Nicotinic Acetylcholine Receptors," <i>Ann. NY Acad. Sci.</i> 505: 194 (1987);			
✓	142	Pauly <i>et al.</i> , "Glucocorticoid Regulation of Sensitivity to Nicotine," in <i>The Biology of Nicotine: Current Research Issues</i> , Lippicello <i>et al.</i> (eds.), pp. 121-139, Raven Press, New York (1992);			
✓	143	Peng <i>et al.</i> , "Human $\alpha 7$ Acetylcholine Receptor: Cloning of the $\alpha 7$ Subunit from the SH-SY5Y Cell Line and Determination of Pharmacological Properties of Native Receptors and Functional $\alpha 7$ Homomers Expressed in <i>Xenopus</i> Oocytes," <i>Mol. Pharm.</i> 45: 546-554 (1994);			
✓	144	Pulver <i>et al.</i> , "Follow-Up of a Report of a Potential Linkage for Schizophrenia on Chromosome 22q12-q13.1: Part 2," <i>Am. J. Med. Genet.</i> 54: 44-50 (1994);			
✓	145	Research Disclosure 371005 (1995);			
✓	146	Risch, "Genetic Linkage and Complex Diseases, With Special Reference to Psychiatric Disorders," <i>Genet. Epidemiol.</i> 7: 3-16 (1990);			
✓	147	Rollins <i>et al.</i> , "Cellular Localization of α -Bungarotoxin Binding and $\alpha 7$ mRNA in the Hippocampus Related to Auditory Gating in the Awake, Behaving Rat," <i>Soc. Neurosci. Abst.</i> 22: 1272 (1996);			
✓	148	Saksela <i>et al.</i> , "Human immunodeficiency virus type 1 mRNA expression in peripheral blood cells predicts disease progression independently of the numbers of CD4 ⁺ lymphocytes," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 91: 1104-1108 (1994);			
✓	149	Saksela <i>et al.</i> , "High Viral Load in Lymph Nodes and Latent Human Immunodeficiency Virus (HIV) in Peripheral Blood Cells of HIV-1 Infected Chimpanzees," <i>J. Virol.</i> 67: 7423-7427 (1993);			
✓	150	Sambrook <i>et al.</i> , <i>Molecular Cloning: A Laboratory Manual</i> , 2nd ed., pp. 7.39-7.52, 9.31-9.58, 16.6-16.15, Cold Spring Laboratory Press, New York (1989);			
✓	151	Samulski <i>et al.</i> , "A Recombinant Plasmid from Which an Infectious Adeno-Associated Virus Genome Can Be Excised <i>In Vitro</i> and Its Use To Study Viral Replication," <i>J. Virol.</i> 61: 3096-3101 (1987);			
✓	152	Samulski <i>et al.</i> , "Helper-Free Stocks of Recombinant Adeno-Associated Viruses: Normal Integration Does Not Require Viral Gene Expression," <i>J. Virol.</i> 63: 3822-3828 (1989);			
✓	153	Sauerwald <i>et al.</i> , "The 5'-Flanking Region of the Synapsin I Gene," <i>J. Biol. Chem.</i> 265: 14932-14937 (1990);			
✓	154	Schmid, "Alu: Structure, Origin, Evolution, Significance and Function of One-Tenth of Human DNA," <i>Prog. Nucl. Acid Res.</i> 53: 283-319 (1996);			
✓	155	Schoepfer <i>et al.</i> , "Brain α -Bungarotoxin Binding Protein cDNAs and MAbs Reveal Subtypes of This Branch of the Ligand-Gated Ion Channel Gene Superfamily," <i>Neuron</i> 5: 35-48 (1990);			
✓	156	Séguéla <i>et al.</i> , "Molecular Cloning, Functional Properties, and Distribution of Rat Brain $\alpha 7$: A Nicotinic Cation Channel Highly Permeable to Calcium," <i>J. Neurosci.</i> 13: 596-604 (1993);			
✓	157	Sham <i>et al.</i> , "Segregation analysis of complex phenotypes: an application to schizophrenia and auditory P300 latency," <i>Psychiat. Genet.</i> 4: 29-38 (1994);			
✓	158	Siegel <i>et al.</i> , "Deficits in Sensory Gating in Schizophrenic Patients and Their Relatives, Evidence Obtained With Auditory Evoked Responses," <i>Arch. Gen. Psychiat.</i> 41: 607-612 (1984);			
✓	159	Silverman <i>et al.</i> , "Evidence of a Locus for Schizophrenia and Related Disorders on the Short Arm of Chromosome 5 in a Large Pedigree," <i>Am. J. Med. Genet.</i> 67: 162-171 (1996);			
✓	160	Sirota <i>et al.</i> , "Schizophrenia and Marfan Syndrome," <i>Br. J. Psychiat.</i> 157: 433-436 (1990);			
✓	161	Spitzer <i>et al.</i> , "Research Diagnostic Criteria, Rationale and Reliability," <i>Arch. Gen. Psychiat.</i> 35: 773-782 (1978);			
Examiner:			Date Considered:		
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.					

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(37 CFR § 1.98(b))		Filing Date: 10/23/97	Group Art Unit: 1645

OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)	
✓	162 Striffler <i>et al.</i> , "Widespread Long-term Gene Transfer to Mouse Skeletal Muscles and Heart," <i>J. Clin. Invest.</i> 90: 626-630 (1992);
✓	163 Tsuang <i>et al.</i> , "Long-term Outcome of Major Psychoses I. Schizophrenia and Affective Disorders Compared with Psychiatrically Symptom-Free Surgical Conditions," <i>Arch. Gen. Psychiat.</i> 36: 1295-1301 (1979);
✓	164 Tsuang <i>et al.</i> , "Genotypes, Phenotypes, and the Brain, A Search for Connections in Schizophrenia," <i>Brit. J. Psychiat.</i> 163: 299-307 (1993);
✓	165 Uetsuki <i>et al.</i> , "Isolation and Characterization of the Human Chromosomal Gene for Polypeptide Chain Elongation Factor-1 α ," <i>J. Biol. Chem.</i> 264:5791 [1989];
✓	166 Ulmer <i>et al.</i> , "Heterologous Protection Against Influenza by Injection of DNA Encoding a Viral Protein," <i>Science</i> 259: 1745-1748 (1993);
✓	167 Vinogradova <i>et al.</i> , "Do Semantic Priming Effects Correlate with Sensory Gating in Schizophrenia," <i>Biol. Psychiat.</i> 39: 821-824 (1996);
✓	168 Vinogradova, in <i>The Hippocampus 2: Neurophysiology and Behavior</i> , Issacson and Pribram (eds.), pp. 3-69, Plenum Press, New York, New York (1975)
✓	169 von Heijne, "A new method for predicting signal sequence cleavage sites," <i>Nuc. Acids Res.</i> 14: 4683-4690 (1986);
✓	170 Voss <i>et al.</i> , "The role of enhancers in the regulation of cell-type-specific transcriptional control," <i>Trends Biochem. Sci.</i> 11:287-289 [1986];
✓	171 Wada <i>et al.</i> , "Distribution of Alpha2, Alpha3, Alpha4, and Beta2 Neuronal Nicotinic Receptor Subunit mRNAs in the Central Nervous System: A Hybridization Histochemical Study in the Rat," <i>J. Compar. Neurol.</i> 284: 314-335 (1989);
✓	172 Waldo <i>et al.</i> , "Codistribution of a Sensory Gating Deficit and Schizophrenia in Multi-affected Families," <i>Psychiat. Res.</i> 39: 257-268 (1991);
✓	173 Waldo <i>et al.</i> , "Auditory sensory gating, hippocampal volume, and catecholamine metabolism in schizophrenics and their siblings," <i>Schizophr. Res.</i> 12: 93-106 (1991);
✓	174 Wang <i>et al.</i> , "Evidence for a susceptibility locus for schizophrenia on chromosome 6pter-p22," <i>Nature Genet.</i> 10: 41-46 (1995);
✓	175 Williams <i>et al.</i> , "Introduction of foreign genes into tissues of living mice by DNA-coated microprojectiles," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 88: 2726-2730 (1991);
✓	176 Wilson <i>et al.</i> , "Habituation of Human Limbic Neuronal Response to Sensory Stimulation," <i>Exp. Neurol.</i> 84: 74-97 (1984);
✓	177 Wilson <i>et al.</i> , "Hepatocyte-directed Gene Transfer in Vivo Leads to Transient Improvement of Hypercholesterolemia in Low Density Lipoprotein Receptor-deficient Rabbits," <i>J. Biol. Chem.</i> 267: 963-967 (1992);
✓	178 Wonnacott, " α -Bungarotoxin Binds to Low-Affinity Nicotine Binding Sites in Rat Brain," <i>J. Neurochem.</i> 47: 1706-1712 (1986);
✓	179 Wu and Wallace, "The Ligation Amplification Reaction (LAR) -- Amplification of Specific DNA Sequences Using Sequential Rounds of Template-Dependent Ligation," <i>Genomics</i> 4:560-569 [1989];
✓	180 Wu and Wu, "Receptor-mediated Gene Delivery and Expression in Vivo," <i>J. Biol. Chem.</i> 263: 14621-14624 (1988);
✓	181 Wu and Wu, "Receptor-mediated <i>in Vitro</i> Gene Transformation by a Soluble DNA Carrier System," <i>J. Biol. Chem.</i> 262: 4429-4432 (1987);
✓	182 Zhang <i>et al.</i> , "Neuronal Acetylcholine Receptors That Bind α -Bungarotoxin with High Affinity Function as Ligand-Gated Ion Channels," <i>Neuron</i> 12: 167-177 (1994).
✓	183 Chini <i>et al.</i> , "Molecular Cloning and Chromosomal Localization of the Human α 7-Nicotinic Receptor Subunit Gene (CHRNA7)," <i>Genomics</i> 19: 379-381 (1994);
✓	184 Doucette-Stamm <i>et al.</i> , "Cloning and Sequence of the Human α 7 Nicotinic Acetylcholine Receptor," <i>Drug Dev. Res.</i> 30: 252-256 (1993);
✓	185 Garcia-Guzman <i>et al.</i> , " α -Bungarotoxin-sensitive Nicotinic Receptors on Bovine Chromaffin Cells: Molecular Cloning, Functional Expression and Alternative Splicing of the α 7 Subunit," <i>Eur. J. Neurosci.</i> 7: 647-655 (1995);
✓	186 Anand and Lindstrom, "Nucleotide sequence of the human nicotinic acetylcholine receptor β 2 subunit gene," <i>Nuc. Acids Res.</i> 18: 4272 (1990);
✓	187 Deneris <i>et al.</i> , "Primary Structure and Expression of β 2: A Novel Subunit of Neuronal Nicotinic Acetylcholine Receptors," <i>Neuron</i> 1: 45-54 (1988);
✓	188 Fornasari <i>et al.</i> , "Structural and Functional Characterization of the Human α 3 Nicotinic Subunit Gene Promoter," <i>Mol. Pharmacol.</i> 51: 250-261 (1997);
✓	189 Fornasari <i>et al.</i> , "Molecular cloning of human neuronal nicotinic receptor α 3-subunit," <i>Neurosci. Lett.</i> 111: 351-356 (1990);

Examiner:	Date Considered:
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EXAMINER:	Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
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FORM PTO-1449 (Modified)		U.S. Department of Commerce Patent and Trademark Office		Attorney Docket No.: UTC-03042	Serial No.: 08/956,518
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use Several Sheets If Necessary) (37 CFR § 1.98(b))				Applicant: Sherry Leonard <i>et al.</i>	
				Filing Date: 10/23/97	Group Art Unit: 1645
OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)					
✓	190	Breese <i>et al.</i> , "Comparison of the Regional Expression of Nicotinic Acetylcholine Receptor $\alpha 7$ mRNA and [125 I]- α -bungarotoxin binding in Human Postmortem Brain," <i>J. Comp. Neurol.</i> 387: 385-398 (1997);			
✓	191	Leonard <i>et al.</i> , "Linkage of a chromosome 15 locus to a neurophysiological deficit in schizophrenia," <i>Am. J. Human Genet.</i> 59: A225 (1996);			
✓	192	Leonard <i>et al.</i> , "Genomic Structure of the Human $\alpha 7$ Neuronal Nicotinic Acetylcholine Receptor Subunit," <i>Abstracts, Society for Neuroscience</i> , 27th Annual Meeting, October 25-30 (1997);			
✓	193	Freedman <i>et al.</i> , "Linkage of a neurophysiological deficit in schizophrenia to a chromosome 15 locus," <i>Proc. Natl. Acad. Sci. U.S.A.</i> 94: 587-592 (1997);			
✓	194	Logel <i>et al.</i> , "Expression of High and Low Affinity Neuronal Nicotinic Receptors in Tissues of Neural Crest Origin," <i>Abstracts, Society for Neuroscience</i> , 27th Annual Meeting, October 25-30 (1997);			
✓	195	Breese <i>et al.</i> , "Abnormal Regulation of High Affinity Nicotinic Receptor Binding in Schizophrenics," <i>Abstracts, Society for Neuroscience</i> , 27th Annual Meeting, October 25-30 (1997);			
✓	196	Gault <i>et al.</i> , "Contig construction across the 15q14 schizophrenia linkage region and candidate gene characterization of the partially duplicated $\alpha 7$ nicotinic receptor," <i>Am. J. Human Genet.</i> 63: A249 (1998);			
✓	197	Leonard <i>et al.</i> , "Additional evidence for a chromosome 15 locus in schizophrenia: Analysis of affected sibpairs from the NMH genetics initiative," <i>Am. J. Human Genet.</i> 63: A297 (1998);			
✓	198	Zetterström <i>et al.</i> , "Polymorphisms at the Calcitonin/GRP- α Gene Locus: Investigation of Possible Associations with Neurological or Psychiatric Disease," <i>Abstracts, Society for Neuroscience</i> , 28th Annual Meeting, November 7-12 (1998);			
✓	199	Drebing <i>et al.</i> , "Expression of the Human $\alpha 7$ Neuronal Nicotinic Acetylcholine Receptor and a Partial Gene Duplication," <i>Abstracts, Society for Neuroscience</i> , 28th Annual Meeting, November 7-12 (1998);			
✓	200	Leonard <i>et al.</i> , "Genomic Organization and Partial Duplication of the Human $\alpha 7$ Neuronal Nicotinic Acetylcholine Receptor Subunit Gene," <i>Abstracts, Society for Neuroscience</i> , 28th Annual Meeting, November 7-12 (1998);			
✓	201	Dudek <i>et al.</i> , "Expression in Human Brain of Novel Exons Associated with a Partial Duplication of the $\alpha 7$ Neuronal Nicotinic Receptor," <i>Abstracts, Society for Neuroscience</i> , 28th Annual Meeting, November 7-12 (1998);			
✓	202	Breese <i>et al.</i> , "Abnormal Regulation of the High Affinity Nicotinic Receptors in Schizophrenia," <i>Abstracts, Society for Neuroscience</i> , 28th Annual Meeting, November 7-12 (1998);			
✓	203	Lee <i>et al.</i> , "The Effect of Nicotine and Haloperidol on High Affinity Nicotinic Receptors and Dopamine D2 Receptors in the Rat Brain," <i>Abstracts, Society for Neuroscience</i> , 28th Annual Meeting, November 7-12 (1998);			
✓	204	Adler <i>et al.</i> , "Schizophrenia, Sensory Gating, and Nicotinic Receptors," <i>Schizophrenia Bulletin</i> 24: 189-202 (1998);			
✓	205	Leonard <i>et al.</i> , "Further Investigation of a Chromosome 15 Locus in Schizophrenia: Analysis of Affected Sibpairs From the NIMH Genetics Initiative," <i>Am. J. Med. Genet.</i> 81: 308-312 (1998)			
✓	206	Gault <i>et al.</i> , "Genomic Organization and Partial Duplication of the Human $\alpha 7$ Neuronal Nicotinic Acetylcholine Receptor Gene (CHRNA7), <i>Genomics</i> 52: 173-185 (1998)			
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